Otth and first published by Zalewski, in 1883; which latter authority for *C. convolvulacearum* is consequently preferred, but the author considers the Schweinitzian name *Æcidium ipomœæ-panduranæ*, given in 1822, as the first name applied to the form on *Convolvulaceæ* in North America.

Mention is made in the same paper of a very interesting *Peronospora*, found to agree with *P. Cubensis*, B. & C., which has been found independently in Cuba, Japan, and New Jersey, in which latter place it has attacked most vigorously the cucumber vines. It is especially interesting biologically as an exception to the general rule that only small conidial spores produce zoospores.—D. G. FAIRCHILD.

CAVARA, DR. F. *Materiaux de Mycologie Lombarde*, Revue Mycologique, October, 1889.

The author gives a list of the fungi of Lombardy, the following orders being represented: *Myxomycetes*, 4; *Zygomycetes*, 4; *Oomycetes*, 12; *Ustilagineæ*, 4; *Uredineæ*, 11; *Discomycetes*, 12; *Pyrenomycetes*, 33; *Hyphomycetes*, 44; *Sphæropsideæ*, 41; *Leptostromaceæ*, 4; *Melanconeæ*, 13; Imperfect forms, 3. Fifteen of the species are new and are fully described and illustrated by two plates. There are also many interesting notes on some of the injurious species.—B. T. GALLOWAY.

FULTON, T. WEMYSS. *The Dispersion of the Spores of Fungi by the Agency of Insects, with Special Reference to the Phalloidei.* Annals of Botany, May, 1889, p. 207.

This interesting article may be divided into two rather distinct parts, the first comprising the results of Mr. Fulton's experiments with *Phallus impudicus*, and the second containing data gathered from different sources to prove that the adaptation of fungi for the visitation of insects is quite general among certain families.

After a description of the structure and development of the common Stinkhorn (*Phallus impudicus*), attention is drawn to the fact, noticed previous to 1575, that the liquefied hymenium, or stinking slime, of this species has great attractions for insects, especially two species of fly, *Musca vomitoria* and *Musca Cæsar*. To settle two important questions suggested by these insects feeding upon the slime filled with the ripe spores of the fungus, the effect of the slime upon the fly and the effect of the fly upon the spores, the author conducted two series of experiments. The first series, involving the first question, proved, as might be expected, that the slime has no effect upon the fly either before or after death. The second series, consisting in an attempt to produce the fungus from spores which had traversed the digestive organs of the fly, was measurably successful, although slightly incomplete, from the fact that only two out of four trials produced the characteristic mycelium, and of these, the one given an opportunity to develop its compound sporophore failed to do it. The author does not mention in his account of the experiment any attempt to free the excrement from

spores which might have been shaken from the feet and proboscides of the flies and have not traversed the digestive canal. From the connection it might naturally be supposed that no attempts were made.

Turning from a determination of the fact experimentally, the author, first making the statement that "it seems very probable that most all of those fungi whose spores are ultimately contained in a slimy or liquid substance of dark color, especially if of a fetid odor, and which is freely accessible, will be found to have their spores largely transported by the agency of insects," takes up the British *Coprini*, pointing out the superficial resemblance of their sporophores to the compound flowers of certain *Compositæ* and calling attention to the fact, in connection, that flies are alike the principal visitors of the flower and the fungus.

The *Phalloidei*, which to the author present the most striking adaptations to insect visitations, occupy considerable space in the paper, short tabulated descriptions—color, odor, habitat, and dimensions—of 59 species being contained. The summary from these descriptive tables shows that the color of the receptacle during the deliquescence of the hymenium in more than half of the species is some tint of red, and in the remainder, white; these colors occurring in 91 per cent. of the 59 species. Table IV gives the colors of more than a thousand species of fungi, other than *Phalloidei*, and reveals the fact that while 91.5 per cent. of the latter are either red or white, only 20.1 per cent. of other fungi are so colored, the great majority being brown, slate, or black—colors scarcely represented in the former group. The bearing of these data upon the author's inference that the brilliant tints of the *Phalloidei* have been developed to render them conspicuous is quite pointed, and when taken in connection with his last table—which is a comparison of 4,197 species of flowers with 59 *Phalloidei* and 1,288 other fungi—becomes doubly so. Table V shows that while only 73 per cent. of flowers and 24.7 per cent. of other fungi are white, red, or yellow—colors found by experiment to be the most conspicuous in wooded localities where fleshy fungi grow—96.6 per cent. of the *Phalloidei* are so colored.

In regard to the odor, determined in the case of 25 species, 76 per cent. were fetid. When this proportion is compared with that of odorous to inodorous flowers—9.9 per cent. determined from 4,189 species—and taken in connection with the numerous facts just mentioned, the author is warranted in concluding that "in the *Phalloidei* it can scarcely be doubted that we have a group of fungi which have undergone great modifications so as to become adapted for the dispersion of their spores by the agency of insects."—D. G. FAIRCHILD.

GIRARD, ALFRED. *Entomogenous Fungi.* Bulletin Scientifique de la France et de la Belgique. January–April, 1889.

This number contains three valuable and practical articles on Entomogenous fungi. The first, entitled (*Sorosporella agrotidis*, nov. gen.